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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/642,228

08/18/2003

Taro Yokoi

040302-0341

2984

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7590

06/06/2006

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EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/642,228

Applicant(s)

YOKOI, TARO

Examiner

Alix Elizabeth Echelmeyer

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12-29-05, 8-18-03
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action is responsive to the amendment filed on April 17, 2006. Claims 1, 3, 4, 6, 13, and 14 have been amended. Claim 2 has been cancelled. Claims 1 and 3-14 are pending and are finally rejected for reasons given below.

### ***Information Disclosure Statement***

2. The Information Disclosure Statement filed December 29, 2005 has been considered.

### ***Specification***

3. In light of Applicant's amendments to the Specification, the examiner's objections from the previous Office Action are withdrawn.

### ***Claim Objections***

4. In light of Applicant's amendments to claims 4, 6, and 14, the examiner's objections from the previous Office Action are withdrawn.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1745

6. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the fuel-line water discharge flow passage can have a flow sectional area smaller than a flow sectional area of the fuel-line water discharge flow passage.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 3-5, 7-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, Jr. et al. (US Patent Number 5,192,627) in view of Komura et al. (US Patent Number 6,242,119) and in further view of Matsuda et al. (US Patent Number 6,742,092).

Regarding claims 1 and 13, Perry, Jr. et al. teach a fuel-line water recovery tank having a water level indicator connected to a central logic system to determine when water should be discharged from the tank, and a valve to open the line that discharges the water from the water reservoir (Figure 2; column 5 lines 35-47; column 6 lines 64-67; column 7 lines 1-15).

Perry, Jr. et al. fail to teach a combustor downstream of the fuel-line water discharge port of the water recovery tank.

Komura et al. teach a combustor to combust excess fuel from the fuel line with oxidant expelled from the oxidant electrode outlet (column 4 lines 12-15).

It would be desirable to add the combustor of Komura et al. to the system of Perry, Jr. et al. in order to combust excess fuel with excess oxidant in order to prevent the release of these unreacted components into the atmosphere.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the combustor of Komura et al. with the system of Perry, Jr. et al. in order to prevent the release of unreacted components into the atmosphere.

Perry, Jr. et al. in view of Komura et al. fail to teach a the second water recovery tank disposed between the combustor and the fuel-line water discharge flow passage closure unit.

Matsuda et al. teach a fuel cell system wherein the outlets of both the anode and the cathode leave the fuel cell, meet in one line, and then enter a combustor.

Having the components meet and travel together in one line as opposed to traveling separately until reaching the combustor is advantageous because it allows the components to mix before entering the combustor and it requires less passageway and less space since only one line is needed instead of two. Further, it is advantageous to place water separators on these lines in order to remove water from the components leaving the fuel cell so that water is not introduced to the combustor unnecessarily. Placing the second water recovery tank between the fuel-line water discharge flow passage closure unit and the combustor allows control over when the contents of the

Art Unit: 1745

fuel-line water recovery tank are allowed to travel to the second tank and the combustor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to put a second tank between the first tank and the combustor in order to conserve space, promote mixing of the fuel and oxidant before entering the combustor, and control when components enter the second tank and the combustor.

As for claim 3, Perry, Jr. et al. teach a water recovery tank for the oxidant line as well as the fuel line as discussed above.

As for claim 4, Perry, Jr. et al. teach a valve in the line after the water recovery tank for the oxidant line and a sensor located in the tank that is in communication with a central logic system that determines when the water should be released from the tank.

Regarding claim 5, Perry, Jr. et al. teach a fuel pressure detector located in a fuel gas flow passage connected to a fuel electrode inlet of the fuel cell (column 4 lines 44-47). This detector is connected to the microprocessor control system, giving the system the ability to use the information from the fuel pressure sensor to determine whether the water discharge flow passage should be opened or closed.

As for claim 7, Perry teaches a fuel pressure detector located in a fuel electrode inlet of the fuel cell that is capable of measuring the pressure of the fuel gas (column 4 lines 44-47). The fuel pressure detector communicates with the microprocessor control system (column 9 lines 55-59) contained in the fuel cell system. Although the detector does not calculate flow rate, the control system could be programmed to use the

Art Unit: 1745

information collected about pressure to determine the flow rate of the fuel electrode inlet.

Regarding claim 8, the fuel cell system of Komura et al. contains a control circuit that has the ability to discriminate when the water should be discharged based on the water level in the tank. Modifying the control circuit to use different data to determine whether the water in the tank should be discharged does not result in a patently distinct invention.

Regarding claims 9 and 12, Perry, Jr. et al. teach a fuel-line gas flow sensor located downstream of the fuel cell (column 11 lines 8-13). Since the sensor communicates with the microprocessor control system (column 9 lines 55-59), it has the ability to do the actions claimed by the applicant.

As for claim 10, Perry, Jr. et al. teach the fuel-line gas discharge discriminator along the fuel-line of gas expelled from the fuel cell according to claim 9 (see number 12 above). Perry also teaches a fuel pressure detector in a fuel electrode inlet of a fuel cell (column 4 lines 44-47). The detector of Perry is attached to the microprocessor control system of the fuel cell system (column 9 lines 55-59). The microprocessor control system of Perry can be used to determine time intervals over which passage closure units have been opened and whether discharging is completed.

As for claim 11, Perry, Jr. et al. teach the fuel-line gas discharge discriminator along the fuel-line of gas expelled from the fuel cell according to claim 9 (see number 12 above). Perry teaches a fuel pressure detector located in a fuel electrode inlet of the fuel cell that is capable of measuring the pressure of the fuel gas (column 4 lines 44-

Art Unit: 1745

47). The fuel pressure detector communicates with the microprocessor control system contained in the fuel cell system (column 9 lines 55-58). The information collected by the fuel pressure detector can be used by the microprocessor control system in a determination of whether the discharging of the water recovery tank is complete.

Since the pressure in the fuel line entering the inlet of the fuel electrode of the fuel cell is related to the flow rate of the fuel entering the fuel cell and the fuel pressure detector communicates with the microprocessor control system, the flow rate of the fuel entering the fuel cell can be calculated. Or, the fuel pressure detector could be replaced with a fuel flow rate detector, eliminating the need to calculate the flow rate based on the pressure.

All aspects of Claim 14 are addressed above, except for the first part of the claim that discusses the preparation of a fuel cell having a fuel electrode outlet and an oxidant electrode outlet. Since these outlets are essential to the preparation of a fuel cell and the remaining parts of the claim are rejected, Claim 14 is rejected as being obvious over Perry, Jr. et al. in view of Komura et al. in further view of Matsuda et al.

### ***Response to Arguments***

9. Applicant's arguments filed April 17, 2006 have been fully considered but they are not persuasive.

10. Applicant's arguments with respect to claims 1 and 3-14 have been considered but are moot in view of the new grounds of rejection as necessitated by Applicant's amendment.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER

Alix Elizabeth Echelmeyer  
Examiner  
Art Unit 1745

aee